

**REMARKS**

Claims 1-4, 6, 8-14, 16-19, 21-31, and 34-44 remain in this application with claims 1, 26, and 39 in independent form. Claims 1, 8, 9, 26, and 39 have been amended and claims 5, 7, 15, 20, 32-33, and 45-46 have been cancelled. No new matter is believed to have been introduced in any of the amendments.

**35 U.S.C. §102 Rejections**

Claims 1-38 stand rejected under 35 U.S.C. §102(e) as being anticipated by Lacarte et al. (United States Patent No. 6,543,556).

***Claim 1***

The Office states that Lacarte et al. discloses at least one additional polyol compound that reads on both the first polyol and the second polyol of the subject application. Further, the Office contends that the density claimed in the subject application is inherent to the teachings of Lacarte et al. owing to the fact that similar materials are employed in both disclosures.

Claim 1 has been amended to further clarify the uniqueness of the invention. Specifically, the first polyol has been amended to have *a hydroxyl number of from 250 to 1000* in addition to having a number-average molecular weight of from 150 to 500 and having at least tetra-functionality. The second polyol has been amended to have *a hydroxyl number of from 20 to 100* in addition to having a molecular weight of from 3500 to 8000.

Referring to Lacarte et al., the additional polyol relied upon by the Office has at least two isocyanate-reactive hydrogens and a hydroxyl number of from 150 to 800.

Since the second polyol has been amended to have a hydroxyl number of from 20 to 100, the additional polyol cannot anticipate both the first and second polyols. Further, the Mannich polyol disclosed in Lacarte et al. has a hydroxyl number of from 400 to 550, which also cannot anticipate both the first and second polyols as claimed. The combination of the “additional polyol” with the Mannich polyol does not anticipate both the first and second polyols as claimed.

Further, claim 1 is directed toward a formulated resin component used to produce a polyurethane foam having a density of less than 1 pound per cubic foot. The Office contends that since similar materials are employed, the density claimed is inherent in Lacarte et al. However, Lacarte et al. is directed toward a formulated resin component used to produce a *closed cell, rigid* polyurethane foam that includes the Mannich polyol and the additional polyol. As appreciated by those of ordinary skill in the art, Mannich polyols are specific polyols that are made by alkoxyating a Mannich base. Further, it is also known that the Mannich base is the condensation product of phenol or a substituted phenol, formaldehyde, and an alkanoamine and has a functionality of 3, 5, or 7. Based upon the disclosure of Lacarte et al., the Mannich polyol has a hydroxyl number of from 400-550. Thus, the starting materials of the subject invention are dissimilar from those disclosed in Lacarte et al.

In Tables 2 and 3 of Lacarte et al., the polyurethane foams formed with the Mannich polyols have a density of 2.67 pounds per cubic foot, 2.52 pounds per cubic foot, and 3.07 pounds per cubic foot (*see also col. 6, lines 12-15*). In other words, the polyurethane foams have a density of at least 152% more than what is recited in claim 1. Additionally, the polyurethane foams of Lacarte et al. have a closed cell content of at least 90 percent, i.e., closed-cell polyurethane foam.

The Office contends that the claimed densities are inherent to the teachings of Lacarte et al. The Federal Circuit explained the standard for determining inherency:

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

*Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268-69, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991) (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)); see also *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 633, 2 U.S.P.Q.2d 1051, 1054 (Fed. Cir. 1987) (“Even assuming Stoller did not recognize that the heel of his process functioned as a heat sink, that property was inherently possessed by the heel in his disclosed process, and, thus, his process anticipates the claimed invention.”).

Lacarte et al. employs different starting materials than the claimed invention and also forms a foam having larger densities than claimed. Thus, the densities claimed in the subject invention are not inherent in the disclosure of Lacarte et al. As such, it is respectfully submitted that the Office has not satisfied the standard for determining inherency.

Since Lacarte et al. does not disclose, teach, or suggest each and every limitation of claim 1 as amended, the 35 U.S.C. §102 rejection is believed to be overcome and claim 1 is believed to be allowable. Claims 2-25, which depend directly or indirectly from claim 1, are also believed to be allowable.

***Claim 26***

The Office contends that Lacarte et al. is directed toward volumetric ratio values reading on values even lower than those claimed. Thus, the Office contends that Lacarte et al. prepares combinations of materials at NCO index values which inherently meet the claimed values.

Claim 26 is directed toward a polyurethane foam that is produced from a polyurethane spraying system, that is *open celled*, and that has a *density of less than 1 pound per cubic foot* and low water absorption. The polyurethane foam is formed from a resin component and an isocyanate component that are reacted in a volumetric ratio having *an isocyanate index of from 15 to 70*. Further, claim 26 has been amended to recite that the first polyol has a hydroxyl number of from 250 to 1000 and the second polyol has a hydroxyl number of from 20 to 100. The isocyanate index is achieved by spraying the resin component and the isocyanate component at a volumetric ratio of from 1:1.2 to 1:5, which produces the isocyanate index of 15 to 70,

In contrast to the claimed invention, Lacarte et al. is directed toward a *closed cell, rigid* polyurethane foam (*see col. 1, lines 33-41 and col. 6, lines 12-15*) that has a *density of at least 2.52 pounds per cubic foot*. Further, the disclosure of Lacarte et al. is silent as to the isocyanate index used to prepare such foams, however, the volumetric ratio of the isocyanate component and the resin component is disclosed as 1:1. The volumetric ratio of the resin and the isocyanate component impacts the type of foam formed and the physical properties of the resultant foam. Since the polyurethane foams of Lacarte et al. differ significantly from those of the subject invention, the isocyanate index of the subject invention is not inherently disclosed in Lacarte et al. and the Office has failed to meet the standard for determining inherency.

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Since each and every limitation of claim 26 is not disclosed expressly or inherently in Lacarte et al., the 35 U.S.C. §102 rejection is overcome and claim 26 is believed to be allowable. Claims 27-38, which depend directly or indirectly from claim 26, are also believed to be allowable.

### **35 U.S.C. §103 Rejections**

Claims 1-46 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gerber et al. (United States Patent No. 5,594,040) in view of Lorenz et al. (United States Patent No. 6,737,471). The Office contends that Gerber et al. discloses preparations of polyurethane foams from the claimed polyols and at low isocyanate indexes. However, the Office states that Gerber et al. does not disclose the particulars of the claimed polyols and/or curing components, such as at least tetrafunctionality and at least one primary amine group. The Office relies upon Lorenz et al. for the particulars of the claimed polyols and/or curing components. Further, the Office contends that it would have been obvious for one of ordinary skill in the art to have employed the tetrols and diamino compounds of Lorenz et al. into the foams of Gerber et al. in order to arrive at the products claimed in the subject application.

Applicant respectfully submits that the Office has failed to establish the requisite *prima facie* case of obviousness. Claims 1, 26, and 39 have been amended to include limitations previously set forth in dependent claims, which have previously been rejected under 35 U.S.C. §103. Therefore, the following remarks are directed toward the independent claims, as amended, having the rejected dependent claims incorporated therein.

Specifically, the Office has failed to provide a teaching or motivation to make the

combination as suggested. The motivation to combine the cited reference must flow from some teaching in the art that suggests the desirability or incentive to make the combination needed to arrive at the claimed invention. The mere fact that the cited references could be so combined would not have made the combination obvious unless the cited references suggested the desirability of the combination. Further, even if the references could be combined, the Office has failed to show that the combination discloses each and every limitation as claimed in the subject application.

***Lack of Suggestion or Motivation***

The claims of the subject invention are directed toward open celled polyurethane foams having a density of less than 1 pound per cubic foot. Comparatively, Gerber et al. is directed toward a polyurethane foam having a density of from 1.5 pounds per cubic foot to 4.99 pounds per cubic foot (*see col. 5, lines 14-17*). Lorenz et al. is directed toward an elastomer having a density of from 12.5 pounds per cubic foot to 87.4 pounds per cubic foot (*see col. 10, lines 3-9*). Thus, one of ordinary skill in the art attempting to manufacture polyurethane foams as disclosed in Gerber et al. would not have looked to the elastomers as disclosed in Lorenz et al.

Such a combination of Gerber et al. with Lorenz et al. employs impermissible hindsight and does not consider the claimed invention as a whole. In other words, the claimed invention is being analyzed element by element as a roadmap to find the prior art components and the Office is discounting the value of combining these elements in a new way to achieve a new result. As is well known, the suggestion to combine references must not be derived by hindsight from knowledge of the claimed invention itself or in view of the Applicants disclosure.

Even further, those of ordinary skill in the art addressing the problems addressed by the subject application, i.e., low density foams having improved flame spread characteristics, water absorption, and water vapor permanence, would not have been motivated to combine Gerber et al. with Lorenz et al. Gerber et al. generally seeks to produce a flexible foam that shows a very high resilience, a very low compression set and a very low hysteresis and are stable, i.e., reduced shrinkage. Lorenz et al. seeks to improve durability of elastomers in humid environments, i.e. under conditions which give rise to hydrolysis. Low density foams that have reduced burning and low water adsorption are not addressed by the combination of stable flexible foams and elastomers formulated to resist hydrolysis when exposed to humid environments. Neither Gerber et al. or Lorenz et al. seek to produce a polyurethane foam having a density of less than 1 pound per cubic foot that has improved flame spread characteristics, water absorption, and water vapor permanence. Even if the art appears combinable or modifiable in a manner that will yield the claimed invention, this is insufficient to make the resultant modification obvious. The art must still suggest the desirability of the modification.

Therefore, it is respectfully submitted that the Office has failed to provide any suggestion or motivation to combine Gerber et al. with the specific features of Lorenz et al. to arrive at the subject invention as claimed.

***Each and Every Feature Not Disclosed***

Even if the combination of Gerber et al. with Lorenz et al. is deemed to be proper, the *prima facie* case of obviousness has still not been established because the combination does not disclose, either expressly or inherently, each and every feature of the claimed invention.

Claims 1, 26, and 39 have been amended to further define the subject invention. Specifically, the curing component has been further defined as a third *polyol having at least one primary amine, a hydroxyl number of from 20 to 800, and a number-average molecular weight of from 150 to 5000*. Further, claim 26 includes the limitation that the resin composition and the isocyanate composition are reacted in a volumetric ratio having an isocyanate index of from 15 to 70. Claim 39 includes the limitation of reacting the resin composition and the isocyanate composition in a volumetric ratio of from 1:1.2 to 1:5 such that the resin composition and the isocyanate composition are reacted having an isocyanate index of from 15 to 70.

Referring to claim 1 and as discussed in paragraph [0019] of the specification as originally filed, the curing component improves rise, gel, and cure times of the polyurethane foams formed therefrom. This improvement reduces and/or eliminates dripping when the components are sprayed. Further, primary amines of the curing component contribute to the open cells of the polyurethane foam which is believed to decrease water absorption.

Referring to claims 26 and 39 and as discussed in paragraph [0027] of the specification as originally filed, when the resin component and the isocyanate component are sprayed at these volumetric ratios and at the associated isocyanate index, the primary amine groups are present in an amount such that unreacted hydroxyl groups remain in the foam, thus dripping is reduced and/or eliminated if the polyurethane foam is burned. This makes the polyurethane foam more useful than other prior art low density foams because the polyurethane foam meets various flammability safety standards. The reduced dripping has not been previously been possible with polyurethane foams that have a lower



density, especially when sprayed at volumetric ratios of 1:1, and as such the prior art low density foams do not meet the various flammability safety standards.

Referring to Gerber et al., the resin composition includes a first polyol (2a) and a second polyol (2b). The first polyol (2a) is a polyoxyethylene-polyoxypropylene polyol having a functionality of 2-3 and a number-average equivalent weight of 1000-3000. The second polyol (2b) is a polyether polyol having a functionality of from 2-8 and a molecular weight of from 200-3000. The polyurethane foams are formed at an isocyanate index of from 70 to 90. The first polyol (2a) has a hydroxyl number range of from 37.3 to 168.0 and the second polyol (2b) has a hydroxyl number range of from 37.3 to 2240.0. As such, Gerber et al. does not disclose, teach, or suggest the second polyol as claimed.

Lorenz et al. discloses a resin composition that includes a first polyol and a second polyol. The first polyol is a polyester polyol having a functionality of from 1-3 and a hydroxyl number of from 20-280. The second polyol is a polyether polyol and has a functionality of from 2-8 and a hydroxyl number of from 10-149. The first polyol has a molecular weight range of from 200.0 to 8400.0 and the second polyol has a molecular weight range of from 751.7 to 44800.0. Thus, Lorenz et al. does not disclose, teach, or suggest the first polyol as claimed.

Gerber et al. does disclose using dimethylaminopropylamine as a catalyst which has a primary amine group. The dimethylaminopropylamine has a molecular weight of 130.2 and is *not a polyol* having a hydroxyl number of from 20 to 800. Therefore, the catalyst disclosed in Gerber et al. does not satisfy the limitation of the curing component, as amended, having a number-average molecular weight of from 150 to 5000. Lorenz et al. does disclose chain extenders that include primary amine groups which include alkanolamines comprising 2 to 12 carbon atoms; N-alkyldialkanolamines; (cyclo)aliphatic

diamines comprising 2 to 15 carbon atoms; and N-alkyl-, N,N'-dialkyl-substituted and aromatic diamines comprising 1 to 20 carbon atoms. However, none of these chain extenders anticipates the curing component comprising a third polyol having at least one primary amine, a hydroxyl number of from 20 to 800, and a number-average molecular weight of from 150 to 5000.

Since, each and every feature claimed is not disclosed, taught, or suggested, it is respectfully submitted that the 35 U.S.C. §103 rejection is overcome and claims 1, 26, and 39 are believed to be allowable. Claims 2-25, 27-38, and 40-46, which depend directly or indirectly from these independent claims, are also believed to be allowable.

#### **Double Patenting**

Claims 1-38 stand rejected on judicially-created non-statutory double patenting grounds over Lacarte et al.

Applicants respectfully traverse this Obvious Double Patenting rejection. More specifically, the Applicants respectfully submit that the Office has not established a *prima facie* case of obviousness. A double patenting rejection of the obviousness-type is “analogous to [a failure to meet] the non-obviousness requirement of 35 U.S.C. §103” except that the patent principally underlying the double patenting rejection is not considered prior art<sup>1</sup>. Therefore, any analysis employed in an obviousness-type double patenting rejection parallels the guidelines for analysis of a 35 U.S.C. §103 obviousness determination<sup>2</sup>.

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<sup>1</sup> *In re Braithwaite*, 379 F.2d 594, 154 USPQ 29 (CCPA 1967).

<sup>2</sup> *In re Braat*, 937 F.2d 589, 19 USPQ2d 1289 (Fed. Cir. 1991); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

As the Office is aware, to establish a *prima facie* case of obviousness, three basic criteria must be met<sup>3</sup>. As discussed above, Lacarte et al. is directed toward a closed cell, rigid polyurethane foam, whereas the subject invention is directed toward an open cell polyurethane foam having a density of less than 1 pound per cubic foot. First, there is no suggestion or motivation, either in Lacarte et al. or in the knowledge of one of ordinary skill in the art, to modify Lacarte et al. to arrive at the claims of the subject invention. Further, Lacarte et al. does not disclose, teach, or suggest, each and every limitation present in claims 1 and 26 as described above.

In view of the remarks set forth above, it is respectfully submitted that no *prima facie* case of obviousness, for purposes of Obvious Double Patenting based on the Lacarte et al., can reasonably be established by the Office. As such, it is respectfully submitted that the Obvious Double Patenting rejection relying on Lacarte et al. is overcome.

Claims 1-38 stand provisionally rejected on judicially-created non-statutory double patenting grounds over copending Application No. 10/936,299 (the '299 application). Applicants respectfully traverse this provisional Obvious Double Patenting rejection.

It is respectfully submitted that there is no suggestion or motivation, either in the '299 application or in the knowledge of one of ordinary skill in the art, to modify the '299 application to arrive at the claims of the subject invention. The '299 application is directed toward a closed cell, rigid polyurethane foam, whereas the subject invention is directed toward an open cell polyurethane foam having a density of less than 1 pound per cubic foot. Further, the '299 application does not disclose, teach, or suggest, each and

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<sup>3</sup> *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991).

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every limitation present in claims 1 and 26 as described above in connection with Lacarte et al.

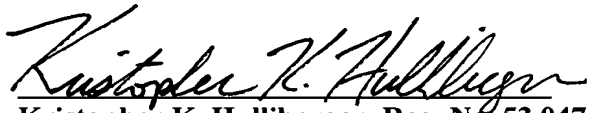
In view of the remarks set forth above, it is respectfully submitted that no *prima facie* case of obviousness, for purposes of Obvious Double Patenting based on the '299 application, can reasonably be established by the Office. As such, it is respectfully submitted that the provisional Obvious Double Patenting rejection relying on the '299 application is overcome.

Accordingly, it is respectfully submitted that the Application, as amended, is now presented in condition for allowance, which allowance is respectfully solicited. Applicant believes that no fees are due, however, if any become required, the Commissioner is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account 08-2789.

Respectfully submitted

**HOWARD & HOWARD ATTORNEYS, P.C.**

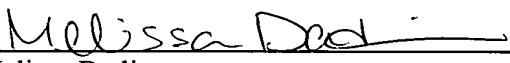
September 20, 2005  
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**CERTIFICATE OF MAILING**

I hereby certify that the enclosed **Amendment** for United States Patent Application Serial No. **10/644,450** filed **August 20, 2003** is being deposited with the United States Postal Service as Express Mail, postage prepaid, in an envelope as "Express Mail Post Office to Addressee", **Mailing Label No. EV 612 874 563 US** and addressed to **Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450**, on **September 20, 2005**.

  
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Melissa Dadisman

KKH/